

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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MYUN-UK CHOI, JIN-HO JUNG, SUNG-
HUN JUNG, SUNG-HEE LEE, and KYUNG-
SUB LEE, Individually and on Behalf of All
Others Similarly Situated,

Plaintiffs,

-against-

TOWER RESEARCH CAPITAL LLC and
MARK GORTON,

Defendants.

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KIMBA M. WOOD, United States District Judge:

Plaintiffs sue on behalf of themselves and a putative class of investors who bought or sold futures contracts based on the Korean KOSPI 200 stock index during overnight trading in 2012. The class Plaintiffs seek to represent consists of investors who traded with Defendant Tower Research Capital LLC (“Tower”) during periods in which Tower allegedly manipulated the overnight market for KOSPI 200 futures. (ECF No. 259.) Plaintiffs also move to appoint Myun-Uk Choi, Jin-Ho Jung, Sung-Hun Jung, and Sung-Hee Lee as class representatives and to appoint Cohen Milstein Sellers & Toll PLLC as class counsel. (ECF No. 258.)

Tower and its founder Mark Gorton (collectively, “Defendants”) oppose class certification. Defendants also move to seal portions of the memoranda of law and exhibits filed in connection with this motion for class certification, on the basis that they contain confidential business information. (ECF Nos. 264, 267, 277.)

Plaintiffs fail to establish that common issues of law or fact predominate over individualized questions, as is required to certify a class pursuant to Rule 23(b)(3) of the Federal

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DATE FILED: 9/27/2022

14-CV-9912 (KMW)

OPINION & ORDER

Rules of Civil Procedure. For this reason, the motion for class certification is DENIED.

Defendants' motions to seal are GRANTED provisionally, except with respect to the passages that are quoted in this Opinion, for no more than ten weeks, absent further order of this Court.

By October 25, 2022, Defendants shall file an unredacted copy of the documents to which they seek to make redactions, red-lining each excerpt they contend should be sealed. Immediately after each excerpt, Defendants shall include an annotation stating the reason or reasons that excerpt should be sealed.

BACKGROUND

I. Factual Background

A. The KOSPI 200 Futures Night Market

The KOSPI 200 is an index of two hundred stocks that trade on the Korea Exchange (the "KRX"), which is the only securities exchange in South Korea. (Second Am. Class Action Compl. ("SAC") ¶ 15, ECF No. 132.) The KOSPI 200 is comparable to the S&P 500 or Dow Jones Industrial Average, indices of the stocks of large companies listed on U.S. exchanges. (*Id.*) The KRX created a derivative product, KOSPI 200 futures contracts, to allow investors to speculate about the future value of the KOSPI 200 index. (*Id.* ¶ 17.) From 5:00 p.m. to 6:00 a.m. Seoul time, trading of KOSPI 200 futures occurs on CME Globex, an electronic platform located in Aurora, Illinois (the "KOSPI 200 Night Market"). (*Id.* ¶ 18.) The platform matches orders to buy (or sell) KOSPI 200 futures with corresponding orders by counterparties who wish to sell (or buy) futures. (*Id.* ¶¶ 18, 21.) Settlement of those trades occurs on the KRX the next day. (*Id.* ¶ 22.)

B. Electronic Limit Order Markets

As is true of many leading exchanges, the KOSPI 200 Night Market is an electronic limit order market. (Expert Report of Hendrik Bessembinder (“Bessembinder Report”) ¶ 11, ECF No. 270-1.) A limit order is a “price-contingent order for specified quantities” of a given futures contract, commodity, security, or other financial instrument. (*Id.*) For example, an investor might place a limit order specifying that she would like to buy five KOSPI 200 futures contracts, but only at a price of 245.75 or lower.¹ This value is called the “limit price” of the investor’s order. (*Id.*) If there are no counterparties willing to sell futures contracts at a price of 245.75 or lower at that time, this investor’s order becomes a “resting” limit order. (*See id.* ¶ 12.) The investor’s buy order remains in a resting state until it is filled by being matched against a corresponding sell order and executing a trade, or until it is canceled by the investor. (*See id.*) The collection of all of the resting buy limit orders, along with all of the resting sell limit orders, is called the “limit order book.” (*Id.*) The highest limit price of all resting buy limit orders is called the “best bid”; the lowest limit price for all sell orders is called the “best offer” or the “best ask.” (*Id.*) Collectively, these two values form the “best bid and offer,” often labeled the “BBO.” (*Id.*) The gap between the two values is called the “bid-ask spread.” (*Id.*)

An order is called a “marketable order” if it is made at a price that matches a resting limit order on the opposite side of the order book. A marketable order triggers the immediate execution of a trade. (*Id.* ¶ 11.) An order is called a “non-marketable” order if placed at a price that does not allow it to be filled immediately. (*Id.*) So, for example, if our first investor’s resting buy limit order at 245.75 was the best bid, an order by a second trader to sell at a price of

¹ The value of a KOSPI 200 futures contract is its price in “points” multiplied by 500,000 Korean won. (SAC ¶ 17.) Traders may place orders at price levels separated by a minimum increment, or “tick,” of 0.05 points, a value of 25,000 Korean won. (*Id.*)

245.70 or higher would be a marketable order that would be filled immediately. The limit order book will frequently contain multiple resting limit orders with which a marketable order could be matched. In those instances, the market operates according to “price/time priority.” (*Id.* ¶ 13.) A marketable order will first trigger the execution of a trade against the resting limit order with the most favorable price (“price priority”). (*Id.*) In the preceding example, the most favorable price is 245.75, the best bid. If there are multiple resting limit orders at the best bid, the first order to be filled will be the one that has “time priority” due to having been placed earlier than any of the other resting limit orders at that price. (*Id.*)

A marketable order will sometimes be large enough to trigger the execution of trades against all of the resting limit orders at the best bid (or best offer). Executing a trade removes the corresponding orders from the order book. (*See id.*) So, executing trades against all resting orders at a given price has the effect of causing the best bid (or best offer) to shift to the next-best price. (*See id.*) A large marketable order will then continue to execute trades against resting orders at the new best bid or best offer, provided that this price is still equal to or better than the marketable order’s limit price. To return to the hypothetical, suppose the second trader’s marketable order was to sell ten contracts at a price of 245.70 or higher, and that there were resting limit orders to buy eight contracts at 245.75 and to buy many more contracts at 245.70. The marketable order would execute trades for eight contracts at 245.75, and then execute trades for the final two contracts at the next-best price of 245.70. Thereafter, 245.70 would be the new best bid. Thus, one way for the price of a futures contract to change is for all of the resting orders at the best bid or best offer to be removed from the order book, either by executing trades against marketable orders or by being canceled. Another way is if an investor “improves on” the BBO by placing a non-marketable order at a more aggressive price—either a buy order with a

limit price higher than the best bid or a sell order with a limit price lower than the best offer. In the preceding hypothetical, a new buy order with a limit price of 245.80 would become the best bid. (*See id.* ¶ 17.)

C. Tower's Trading Strategy

Tower is a high-frequency trading firm that was founded in 1998 by Mark Gorton. (SAC ¶ 55.) High-frequency trading firms use computer algorithms to place orders and execute trades at extremely fast speeds, measurable in milliseconds, making small amounts of money on each of a very large number of trades. (*Id.*) High-frequency trading firms employ numerous trading strategies. One prominent strategy is “market making.” With such a strategy, a firm places limit orders at or near both the “best bid” and the “best offer” prices. (*See* Bessembinder Report ¶¶ 15–22.) Market-makers seek to “earn the ‘bid-ask spread.’” by purchasing a security at the “best bid” price and then re-selling it at the higher “best offer” price. (*Id.* ¶ 19.) By earning this small amount on a large number of series of trades, a market-maker can make a substantial profit. A second prominent class of strategies is “arbitrage.” A trader using this strategy attempts to “identify[] securities or contracts that are mispriced” and exploit the difference between the security’s current value and the trader’s estimate of the accurate value of that security. (*Id.* ¶ 23.) There are also numerous less savory trading strategies that some high-frequency traders might employ. One such practice is “spoofing,” which is defined as the practice of “bidding or offering with the intent to cancel the bid or offer before execution.” 7 U.S.C. § 6c(a)(5)(C). Traders can place “spoof” orders in furtherance of several aims. According to the Commodity Futures Trading Commission, these aims include (1) “overload[ing] the quotation system of a[n] exchange,” (2) “delay[ing] another person’s execution of trades,” (3) “creat[ing] an appearance of false market depth,” and, most traditionally, (4) “creat[ing] artificial price movements

upwards or downwards.” *Antidisruptive Practices Authority*, 78 Fed. Reg. 31890, 31896 (May 28, 2013).

Tower was highly active on the KOSPI 200 Night Market in 2012. Plaintiffs’ expert calculated that Tower was on either the buy side or the sell side of the trade (or both) for more than fifty percent of the contracts traded in the KOSPI 200 Night Market. (Expert Report of Haim Bodek (“Bodek Report”) ¶ 21, ECF No. 262-1.) Neither party’s expert could identify another single entity that has participated in such a high proportion of trading in a market. (*Id.* ¶ 26; Bessembinder Dep. Tr. at 152:20–153:2, ECF No. 275-2.)

As described in the parties’ expert reports, Tower used two broad trading strategies.² With its first strategy, Tower placed symmetrical sets of non-marketable orders on both sides of the market, at prices “behind the best bid and ask.” (Bodek Report ¶ 73.) In other words, these orders included buy orders with a limit price lower than the best bid and sell orders with a limit price higher than the best offer. Such orders would be further back in the price/time priority queue than orders at the best bid or best offer. With its second strategy, Tower placed larger numbers of marketable orders either on the buy side or the sell side of the market. (*See id.* ¶ 41.) These orders would execute trades against resting limit orders on the opposite side of the order book.

² Plaintiffs’ liability theory changed markedly after the Second Circuit sustained dismissal of all claims other than those for unjust enrichment. The operative complaint alleges that Tower used a traditional, one-sided form of spoofing. With such an approach, the spoofing trader places a large order on one side of the market, which artificially pushes the price up or down. *See Gamma Traders - I LLC v. Merrill Lynch Commodities, Inc.*, 41 F.4th 71, 75 (2d Cir. 2022). Then, the spoofing trader quickly cancels his first order and places a new order on the opposite side of the market—which will execute trades at the artificially low or artificially high price. *See id.* After the completion of discovery, Plaintiffs’ expert now asserts that Tower engaged in a two-sided form of spoofing. As detailed *infra*, Plaintiffs’ expert contends that Tower placed orders on both sides of the market in order to entice other traders into placing additional orders on the order book. This practice, he argues, permitted Tower to execute a greater number of favorable trades when it sought to buy or sell.

The parties' experts interpret these trading strategies in starkly different ways. Plaintiffs' expert, Haim Bodek, portrays Tower's two strategies as working in concert. He labels the first strategy the "Supporting Strategy." (*Id.* ¶ 29.) He contends that Tower placed non-marketable orders not with the intent to trade, but to "create[] an illusion of interest in the market" and thereby "lure[]" traders into placing additional orders in a market they perceived as more active. (*Id.* ¶ 73.) These "Supporting Orders" were spoof orders, he says, because they "were engineered to be cancelled if the orders were ever at risk of being executed." (*Id.*)

Bodek calls the second strategy the "Aggressive Strategy." (*Id.* ¶ 41.) Tower would use this strategy when its algorithm projected that the price of KOSPI 200 futures was about to rise or fall. (*Id.* ¶¶ 71–72.) If the algorithm projected that the price would rise, for example, Tower would place a large, marketable buy order. Plaintiffs assert that the order book would have more resting sell limit orders at each price level at the time that Tower placed this large order, because of the luring effect of the Supporting Orders. Tower was thus able to execute more trades at the most favorable prices before exhausting the sell limit orders at each price level—at which point it would need to move up to the next-best price level if it wished to continue buying. Tower was able to "pick off" the orders it had lured in before those traders were able to adjust their trading strategy. (*See* Bessembinder Report ¶ 19 (describing "picking off" risk).) In other words, "the [S]upporting [O]rders were placed to attract and entice other parties to come in so Tower could beat them over the head with the [A]ggressive [S]trategy." (Bodek Dep. Tr. at 193:2–18, ECF No. 270-2.) Bodek supports his interpretation by reference to the high volume of orders placed by Tower, the low fill rate of Supporting Orders, and aspects of Tower's computer code that he says reveal "a strategy which deliberately avoided trades getting filled." (Bodek Report ¶¶ 24, 47–49, 61.)

Defendants’ expert, Professor Hendrik Bessembinder, portrays Tower’s trading strategies as legitimate, profitable, and beneficial to the rest of the market. He characterizes the first strategy of placing non-marketable orders as a way to manage the risks inherent to market-making. Placing non-marketable orders allows a market-maker to establish price/time priority at a given price level, and also to manage the risks inherent to market-making. (Bessembinder Report ¶¶ 19–20.) Bessembinder portrays the second strategy as a simple “arbitrage” strategy, in which Tower would seek to act more quickly than other traders when its algorithm determined that KOSPI 200 futures were likely soon to increase or decrease in price. (*Id.* ¶¶ 29, 31.)

II. Procedural Background

A. Procedural History

This opinion assumes familiarity with the early procedural history of this case, which has been set forth in numerous decisions of this Court and the Second Circuit. We rejoin the story after the Second Circuit affirmed this Court’s entry of summary judgment dismissing Plaintiffs’ Commodity Exchange Act claims. *Choi v. Tower Rsch. Cap. LLC* (“*Choi VII*”), 2 F.4th 10 (2d Cir. 2021). Thereafter, Plaintiffs moved forward with their only remaining claim, a state law claim of unjust enrichment. On September 16, 2021, Plaintiffs filed their motion to certify an unjust enrichment class. (ECF No. 258.) Defendants oppose the motion. The parties submitted multiple expert reports in support of or in opposition to class certification. (ECF Nos. 262-1, 262-2, 270-1, 284-1.)³

³ It is unsettled in the Second Circuit in what circumstances, if any, an expert report must satisfy the standard of *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579 (1993), before it may be used at the class-certification stage. *See In re U.S. Foodservice Inc. Pricing Litig.*, 729 F.3d 108, 129 (2d Cir. 2013). The weight of authority in this circuit supports applying the *Daubert* standard to a motion to exclude an expert report at the class-certification stage. *See In re Kind LLC “Healthy & All Nat.” Litig.*, 337 F.R.D. 581, 604–05 (S.D.N.Y. 2021) (Pauley, J.). While Defendants invoke the principles of *Daubert*, neither party moved to exclude its adversary’s expert reports as inadmissible pursuant to *Daubert*. As detailed below, Plaintiffs fail to prove predominance even when one

B. Proposed Class Definition

Plaintiffs propose a class that consists of “[a]ll entities who transacted with Defendant Tower in KOSPI 200 Futures Contracts on the KOSPI 200 Night Market via the CME Globex January 1, 2012 through December 31, 2012 during an Unfavorable Artificial Price State.” (Mem. at 2, ECF No. 261.)

Plaintiffs define an “Artificial Price State” as occurring “when the market price of KOSPI 200 Futures Contracts has been altered by Tower’s manipulative trading.” (*Id.* at 2 n.2.) Bodek posits that an “Artificial Price State” begins whenever Tower uses a particular trading pattern: that is, canceling one or more resting limit orders at a given price on one side of the order book (e.g., the sell side) followed by executing a “sweep”—“trades of more than 10 contracts at a given price in consecutive executions”—on the opposite side of the order book (e.g., the buy side). (Bodek Report ¶ 45.) Bodek deems the “Artificial Price State” to end when Tower executes a sweep in the contrary direction (e.g., the sell side). (Bodek Dep. Tr. at 118:10–119:19.)

Plaintiffs do not consider every Artificial Price State “Unfavorable.” A state is “Unfavorable” for purchasers when the price “is artificially high” and “Unfavorable” for sellers when the price “is artificially low.” (Mem. at 2 n.2.) Bodek contends that a trade’s price is “artificially high” if it is higher than one of two benchmark values. First is the “Volume-Weighted Average Price” (“VWAP”) of trades of KOSPI 200 futures that were executed between five minutes and ten minutes after the trade in question. (Bodek Report ¶¶ 105, 107.) Second is the price at a time when Tower’s “net position . . . is less than 5 contracts” and “the

considers Bodek’s expert reports. The Court therefore declines to reach the question of whether an expert report must always satisfy a full *Daubert* inquiry before it can be considered in deciding a class-certification motion.

[A]rtificial [P]rice [S]tate has ended pursuant to [Bodek’s methodology.]” (Bodek Rebuttal Report ¶ 54, ECF No. 262-2.)

LEGAL STANDARD

A party seeking certification of a class must first prove that the proposed class satisfies the four prerequisites of Rule 23(a): numerosity, commonality, typicality, and adequacy of representation. Fed. R. Civ. P. 23(a). The party must also show that the proposed class fits within one of the categories of Rule 23(b). Where, as here, a plaintiff moves to certify a class pursuant to Rule 23(b)(3), he or she must show that (1) “questions of law or fact common to class members predominate over any questions affecting only individual members,” and (2) “a class action is superior to other available methods for fairly and efficiently adjudicating the controversy.” Fed. R. Civ. P. 23(b)(3). Common questions predominate over individual questions “if resolution of some of the legal or factual questions that qualify each class member’s case as a genuine controversy can be achieved through generalized proof, and if these particular issues are more substantial than the issues subject only to individualized proof.” *Scott v. Chipotle Mexican Grill, Inc.*, 954 F.3d 502, 512 (2d Cir. 2020) (quoting *Moore v. PaineWebber, Inc.*, 306 F.3d 1247, 1252 (2d Cir. 2002)). In addition, the Second Circuit has recognized that that Rule 23 contains an implied requirement of “ascertainability.” *In re Petrobras Sec.*, 862 F.3d 250, 260 (2d Cir. 2017). This “modest threshold requirement” is satisfied if a class “is defined using objective criteria that establish a membership with definite boundaries.” *Id.* at 257, 269.

The moving party must “affirmatively demonstrate” his or her compliance with the requirements of the Rule. *Wal-Mart Stores, Inc. v. Dukes*, 564 U.S. 338, 350 (2011). A district

court may certify a class only if it is satisfied, after a “rigorous analysis,” that each Rule 23 requirement is met. *Comcast Corp. v. Behrend*, 569 U.S. 27, 33 (2013) (quoting *Wal-Mart*, 564 U.S. at 351). This inquiry frequently may “overlap with the merits” of plaintiffs’ substantive claims. *Id.* at 33–34. The district court “must resolve material factual disputes relevant to each Rule 23 requirement” and “must find that each requirement is established by at least a preponderance of the evidence.” *In re U.S. Foodservice Inc. Pricing Litig.*, 729 F.3d 108, 117 (2d Cir. 2013) (citations and internal quotation marks omitted).

DISCUSSION

Defendants raise a host of arguments against the putative class’s eligibility for class treatment. The Court need address only the requirement that Plaintiffs demonstrate that common questions predominate over individual ones. Fed. R. Civ. P. 23(b)(3). Plaintiffs fail to do so twice over. First, given their current theory of liability, Plaintiffs cannot establish that a class member is entitled to relief unless they can show that Tower traded with that class member at an artificial price and that the class member was enticed into placing an order that he would not have made but for Tower’s Supporting Strategy. Plaintiffs have not shown that they could accomplish either task using generalized proof. Second, the damages methodology proposed by Plaintiffs’ expert is inconsistent with Plaintiffs’ theory of liability in several fundamental respects. The methodology therefore fails to satisfy the standard announced in *Comcast* and cannot be relied upon to show that damages can be determined using a classwide methodology.

I. Choice of Law

The parties dispute whether it is necessary for the Court to conduct a choice-of-law analysis for this motion. As with the rest of Rule 23(b)(3), Plaintiffs bear the burden to show

that there are not variations in applicable law that cause individualized issues to predominate over common issues. *See Langan v. Johnson & Johnson Consumer Cos., Inc.*, 897 F.3d 88, 97 (2d Cir. 2018). Plaintiffs argue that a choice-of-law analysis is unnecessary because Defendants purportedly “conceded” that New York law applied, in their prior briefing in support of their motion to dismiss. (Reply at 35, ECF No. 275.) This contention is unsupported and unpersuasive. Plaintiffs provide no authority to support the notion that a party’s invocation of the law of one state during a prior stage of litigation precludes that party from raising choice-of-law arguments at the class-certification stage.⁴

Plaintiffs’ second argument, that there is no “actual conflict” between the laws of unjust enrichment that might apply, is equally unavailing. Sitting in diversity, the Court applies the choice-of-law rules of the forum state. *Kinsey v. N.Y. Times Co.*, 991 F.3d 171, 176 (2d Cir. 2021). New York has a two-step choice-of-law framework. Step one is to determine whether there is any “actual conflict” between the jurisdictions’ laws that might apply. *Id.* (quoting *Booking v. Gen. Star Mgmt. Co.*, 254 F.3d 414, 419–20 (2d Cir. 2001)). Only if there is an actual conflict does a court proceed to step two, in which it applies the appropriate New York choice-of-law test to determine which substantive law governs. *Id.* Plaintiffs did not brief the question at step one: whether there are substantive differences in the laws that might arguably govern in this action, such as the unjust enrichment laws of New York, Illinois, South Korea, and

⁴ The sole authority Plaintiffs cite in support of their position is a report and recommendation addressing an entirely distinct—and impertinent—question. That report and recommendation applied a plaintiff’s chosen law for purposes of resolving a motion because the defendants had failed entirely to file an opposition to *that particular motion*. *See Lewis Fam. Grp. Fund LP v. JS Barkats PLLC*, No. 16-CV-5255, 2021 WL 1203383, at *10 (S.D.N.Y. Mar. 31, 2021) (Cott, M.J.), *report and recommendation adopted*, No. 16-CV-5255, 2021 WL 4341080 (S.D.N.Y. Sept. 23, 2021) (Nathan, J.). This authority therefore does not support Plaintiffs’ argument. Additionally, the *In re LIBOR* court confronted a similar concession argument and noted that binding absent class members on the basis of a purported concession could risk violations of the Rules Enabling Act and Due Process Clause. *In re LIBOR-Based Fin. Instruments Antitrust Litig.*, 299 F. Supp. 3d 430, 601 (S.D.N.Y. 2018) (Buchwald, J.).

other jurisdictions in which class members are domiciled.⁵ Instead, Plaintiffs rely upon the limited choice-of-law analysis that the Court conducted in deciding the motion to dismiss, which was, as is typical, less rigorous than the analysis performed at the class-certification stage. There are notable differences between the unjust enrichment laws of various states, not to mention South Korea and other countries in which Plaintiffs might reside.⁶ The Court cannot conclude that Plaintiffs—who bear the burden with respect to this question, *Langan*, 897 F.3d at 97—have shown that an actual conflict does not exist.

Step two of the choice-of-law framework would present thorny questions, but they need not be decided. Courts conducting a choice-of-law inquiry for unjust enrichment claims vary in whether they use the “interest analysis” test applicable to tort claims, or the “center of gravity” test applicable to contract claims. *Gerloff v. Hostetter Schneider Realty*, No. 12-CV-9404, 2014 WL 1099814, at *9 (S.D.N.Y. Mar. 20, 2014) (Schofield, J.). Which test is selected often depends on whether a plaintiff’s unjust enrichment claims “sound more in tort than in contract,” in which case the “interest analysis” test is applied, *In re LIBOR*, 299 F. Supp. at 600, or sound more in contract, in which case the “center of gravity” test is applied, *see M’Baye v. N.J. Sports Prods., Inc.*, No. 06-CV-3439, 2007 WL 431881, at *10 (S.D.N.Y. Feb. 7, 2007) (Chin, J.). The unusual theory of liability now advanced by Plaintiffs arguably sounds in both tort and contract.

⁵ Each of the proposed class representatives resides in South Korea. (SAC ¶¶ 8–12.) Plaintiffs have not identified the states or countries in which other putative class members live. They write, however, that “the potential class consists of thousands of members that are likely widely dispersed geographically,” suggesting that the class may include domiciliaries of numerous jurisdictions. (Mem. at 25.)

⁶ For example, states’ laws of unjust enrichment vary in whether an indirect benefit to a defendant is sufficient to state a claim, *In re Actiq Sales & Mktg. Pracs. Litig.*, 307 F.R.D. 150, 166 n.25 (E.D. Pa. 2015), whether a plaintiff must prove actual loss or impoverishment, *see In re Grand Theft Auto Video Game Consumer Litig.*, 251 F.R.D. 139, 148 (S.D.N.Y. 2008) (Kram, J.), whether the misconduct alleged must have included dishonesty or fraud, *Clay v. Am. Tobacco Co.*, 188 F.R.D. 483, 501 (S.D. Ill. 1999), and even whether unjust enrichment can stand alone as an independent cause of action, *In re Actiq Sales & Mktg.*, 307 F.R.D. at 165 n.23.

(See Reply at 37 n.15.) Using one test rather than the other could well lead to different law being applied in this case.⁷ Plaintiffs have failed “to demonstrate that any variations in relevant state laws do not predominate over the similarities.” *Langan*, 897 F.3d at 97.

As explained below, Plaintiffs fall short of demonstrating that common issues predominate in the determinations of liability and of damages, even if one accepts their position that New York law governs. The Court thus assumes without deciding that New York law applies.

II. Liability

To determine whether a party seeking class certification has satisfied the predominance requirement, a court “must assess (1) the ‘elements of the claims and defenses to be litigated’; and (2) ‘whether generalized evidence could be offered to prove those elements on a class-wide basis or whether individualized proof will be needed to establish each class member’s entitlement to relief.’” *Johnson v. Nextel Commc’ns Inc.*, 780 F.3d 128, 138 (2d Cir. 2015) (quoting JOSEPH M. McLAUGHLIN, *McLAUGHLIN ON CLASS ACTIONS* § 5:23 (11th ed. 2014)). A district court conducts this assessment to decide “whether the common issues can profitably be tried on a classwide basis, or whether they will be overwhelmed by individual issues.” *Id.* Under New York law, the elements of unjust enrichment are: “(1) that the defendant benefitted; (2) at the plaintiff’s expense; and (3) that equity and good conscience require restitution.” *Choi*

⁷ If the unjust enrichment claim were analyzed pursuant to the “interest analysis” test, the parties agree that the claim would be considered analogous to a conduct-regulating tort rule. (See Mem. in Opp’n at 42–43, ECF No. 269; Reply at 40.) For such a rule to apply to a tort such as this one, in which the place of the wrongful conduct and the place of injury differ, the law of the place of the allegedly wrongful conduct—here, New York—generally governs. See *Licci ex rel. Licci v. Lebanese Canadian Bank, SAL*, 739 F.3d 45, 50 (2d Cir. 2013). But if the “center of gravity” test were applied, factors such as the place of performance, the location of the subject matter of the contract, and Plaintiffs’ domicile could point toward South Korea and other jurisdictions around the world. See *AEI Life LLC v. Lincoln Benefit Life Co.*, 892 F.3d 126, 135 (2d Cir. 2018).

v. Tower Rsch. Cap. LLC (“*Choi III*”), 890 F.3d 60, 69 (2d Cir. 2018) (quoting *Kaye v. Grossman*, 202 F.3d 611, 616 (2d Cir. 2000)). With respect to each of these three elements, Plaintiffs have failed to demonstrate that they could prove the element on a classwide basis using generalized evidence. Individual issues thus predominate over common issues when determining each plaintiff’s entitlement to relief. This is fatal to Plaintiffs’ motion for class certification.

A. Whether Defendants Benefitted

The first element of unjust enrichment requires Plaintiffs to show that Defendants benefitted due to their assertedly wrongful conduct. Plaintiffs’ attempts to demonstrate that they could prove a benefit to Defendants with generalized evidence suffer from several decisive shortcomings. As set forth above, Plaintiffs characterizes Tower’s trading strategy as operating in two parts. First, Tower placed resting limit orders (“Supporting Orders”) near the best bid and best offer. This practice allegedly lured other investors to place their own resting limit orders at the same price levels. Second, Tower placed a large, marketable order on one side of the market when its algorithm predicted that the price of KOSPI 200 futures would soon rise or fall. Plaintiffs contend that, because of the extra orders Tower lured into the market, Tower could execute more trades at favorable prices before exhausting the sell limit orders at each price level.

Defendants benefit, according to this theory, in that Tower was able to execute trades at an artificial price more favorable than the price that otherwise would have prevailed. Plaintiffs argue that this benefit (and the corresponding harm to Tower’s counterparties) is equal to the difference between the “artificial” price at which the trade actually was executed and the “true price,” as measured in comparison to one of Bodek’s proposed benchmarks. (*See* Bodek Report ¶¶ 105, 108.)

Plaintiffs assert that they can “identify and measure the [a]rtificial [p]rices created by Tower’s algorithm” as a common issue. (*See* Mem. at 1.) Plaintiffs fail to show that this can be done. Generally, “an artificial price is a price that ‘does not reflect basic forces of supply and demand.’” *CFTC v. Wilson*, No. 13-CV-7884, 2018 WL 6322024, at *13 (S.D.N.Y. Nov. 30, 2018) (Sullivan, J.) (quoting *CFTC v. Parnon Energy Inc.*, 875 F. Supp. 2d 233, 246 (S.D.N.Y. 2012) (Pauley, J.)). “Proving the existence of an artificial price is difficult – and with good reason,” because “[t]he laws that forbid market manipulation should not encroach on legitimate economic decisions lest they discourage the very activity that underlies the integrity of the markets they seek to protect.” *Id.* at 15 (internal quotation marks omitted).

Plaintiffs have provided neither a credible theoretical explanation nor convincing empirical evidence for the existence of artificial prices in this case. Judge Buchwald addressed a similar circumstance in *In re LIBOR*. In that case, a set of plaintiffs alleged that they had bought Eurodollar futures contracts at artificial prices, because the price of the contracts was based in part on the London Interbank Offered Rate (“LIBOR”) interest rate benchmark that the defendants had manipulated. The court held that the plaintiffs had to show with classwide proof how prices would have differed in a but-for world in which the defendants had not manipulated the LIBOR rate. *In re LIBOR*, 299 F. Supp. 3d at 541, 552. As was true in *In re LIBOR*, Plaintiffs in this case fail to establish that they can show prices to be artificial using classwide proof. Indeed, Plaintiffs offer a model that suffers from an inability to distinguish between prices that are the result of the legitimate supply and demand and those that are due to Tower’s alleged manipulation.

A first, glaring flaw is that Bodek’s model is unable actually to substantiate whether any price was altered by Tower’s conduct. A stylized hypothetical makes clear how this is so.

Imagine that, in the absence of any Supporting Orders by Tower, there would be resting limit orders by other traders to sell twenty KOSPI 200 futures contracts at 255.25 (the best offer) and twenty contracts one tick higher, at 255.30. Then, suppose that Tower carries out its “Supporting Strategy” and thereby lured other investors into placing limit orders to sell ten more contracts at 255.25 and ten more at 255.30, for a total of thirty contracts at each price level. Tower’s algorithm projects an imminent increase in the price of KOSPI 200 futures, so it cancels a sell limit order of its own that was resting at the best offer at 255.25 and places a marketable order to buy fifteen contracts at the same price. By definition, Bodek’s model considers this pattern of trading to create a so-named “Artificial Price State.” Yet, Tower would trade at an *identical* price in both the but-for world without its alleged manipulation and in a world in which Tower’s Supporting Strategy lured in additional orders. Either way, Tower’s marketable order would execute trades to purchase fifteen contracts at a price of 255.25 each.

Imagine now that, between five and ten minutes after Tower’s trades, the average price for KOSPI 200 futures had risen to 255.50. Bodek’s model concludes, inexplicitly, that Tower’s order “should have traded” at this higher price. (Reply at 34.) Bodek’s model cannot show that Tower traded at an artificial price—these transactions would have occurred at an identical price with or without Tower’s alleged manipulation. Yet, his model attributes to Defendants a benefit equal to the difference between the execution price and the average price five-to-ten minutes later.

A second flaw is equally important. Even if one could show that Tower manipulated the price of some trades, Bodek’s model does not distinguish trades with an execution price unaltered by manipulation. Suppose that, in the stylized hypothetical market described above, Tower placed marketable orders to buy thirty contracts rather than fifteen. In the but-for world

without Tower's alleged manipulation, Tower could execute twenty trades at the best offer price: 255.25. The final ten contracts would be filled at the next-best price: 255.30. In the world in which Tower lured in orders to sell ten additional contracts at each price level, Tower could execute trades for all thirty contracts at the best offer price of 255.25. In this scenario, one could conclude that Tower benefitted when it was able to purchase the final ten trades at a lower price than in the but-for world. Yet, Bodek concludes that Tower benefitted from trading at an artificial price for *all thirty contracts*, and deems the counterparties for the trades of all thirty contracts to have claims for unjust enrichment.

A final flaw emphasizes the arbitrariness underlying Bodek's choice of benchmark. Bodek's five-minute VWAP benchmark assumes that the average price of a security five-to-ten minutes after a given trade is executed is the "true price" that should have prevailed at the time of the trade.⁸ Bodek's model cannot distinguish between a shift in price that matches Plaintiffs' theory—i.e., the market moving toward the equilibrium "true price" that should have prevailed at time zero—and a shift in price due to unrelated, later-occurring events. Both experts recognize that the value of KOSPI 200 futures correlates with the price of futures based on other equity markets, such as S&P 500 E-mini futures. (Bessembinder Report ¶ 20 n.20; *see* Bodek Dep. Tr. at 35:7–14.) Bodek acknowledged that a number of so-named Artificial Price States should not be treated as actually embodying artificial prices, because a "correlated market was the primary driver of the price." (Bodek Dep. Tr. at 245:12–13.) But Bodek's current model has no way to draw this distinction. The model treats every price change the same, whether it is driven by a

⁸ Bodek does not provide a great amount of detail about the alternative benchmark he introduced in his rebuttal report. However, he reports that this second benchmark would have the effect of more than doubling the amount of calculated damages. (Bodek Rebuttal Report ¶¶ 54–55.) This strongly suggests that his second benchmark would typically set the comparison point even further into the future relative to the trade in question, providing more time for the price to shift.

shift in the price of S&P 500 futures that begins a few minutes *after* a Tower sweep trade—a price change that cannot be attributed to Tower—or whether it is caused by the purportedly “slowed down” movement of the price to its “true” equilibrium because of Tower’s Supporting Strategy. (Bodek Dep. Tr. at 96:21–22.)

Plaintiffs invoke two areas of law featuring artificial prices: securities fraud and misrepresentation regarding consumer products. But there are well-established methods of determining price artificiality caused by each of those types of misconduct. In securities actions, plaintiffs often allege harm from having purchased a company’s stock at a price that had been inflated by official misrepresentations. The size of the drop in a stock’s price when the truth comes to light provides an objective starting point to demonstrate price artificiality. *See Goldman Sachs Grp., Inc. v. Ark. Tchr. Ret. Sys.*, 141 S. Ct. 1951, 1961 (2021). Cases alleging overpayment for consumer products also feature well-established methods, such as consumer surveys, for determining the “price premium” consumers paid due to misrepresentations about a product. *See, e.g., de Lacour v. Colgate-Palmolive Co.*, 338 F.R.D. 324, 344 (S.D.N.Y. 2021) (Wood, J.) (certifying a Rule 23(b)(3) class based on a price premium theory). Plaintiffs’ unorthodox theory that Defendants used “two-sided” spoofing to draw orders into both sides of the market lacks a similar, tried-and-true method to establish the existence of artificial prices.

Without a valid method of establishing artificial prices, Plaintiff’s expert resorts to arbitrary assumptions, such as assuming that the “true” price for the trade is the price that prevails five-to-ten minutes after the trade. Similarly, Bodek’s use of misleading labels such as “Artificial Price Detector” implies that Bodek’s model does what it cannot: detect artificial prices. Plaintiffs have not shown that they can use generalized proof “to identify and measure the [a]rtificial [p]rices created by Tower’s algorithm.” (Mem. at 1.)

B. Whether Defendants' Benefit Came at Plaintiffs' Expense

For these same reasons, Plaintiffs cannot identify with common evidence a “true price” at which a given trade should have occurred rather than the actual execution price. Individualized issues would predominate in Plaintiffs’ attempts to demonstrate that trades benefitted Defendants “at the plaintiff’s expense.” *Choi III*, 890 F.3d at 69 (quoting *Kaye*, 202 F.3d at 616).

C. Whether Equity and Good Conscience Require Restitution

The final element of unjust enrichment poses the most intractably individualized issues. The inquiry is whether “equity and good conscience require restitution.” *Id.* “An ‘indispensable ingredient’ of th[is] equity and good conscience requirement is the existence of ‘an injustice as between the two parties involved.’” *Vaccariello v. XM Satellite Radio, Inc.*, 295 F.R.D. 62, 75 (S.D.N.Y. 2013) (Owen, J.) (quoting *In re Jetblue Airways Corp. Priv. Litig.*, 379 F. Supp. 2d 299, 330 (E.D.N.Y. 2005)).

Plaintiffs cannot establish that equity counsels in favor of restitution without demonstrating that a given putative class member was lured by Tower into placing its non-marketable order. Some number of Tower’s counterparties would have placed the same number of non-marketable orders at the same limit price, regardless of Tower’s allegedly manipulative Supporting Strategy. There are at least two types of orders that Tower cannot have lured into the market. First, there are non-marketable orders that were placed prior to Tower’s first Supporting Order but that executed a trade subsequent to a Tower sweep. Second, there are orders that were placed subsequent to Tower’s first Supporting Order but that would have been placed even in the absence of Tower’s Supporting Orders. Traders who placed orders in this second category may have been unaware of Tower’s Supporting Orders or may not have weighed them significantly.

These non-lured orders would execute trades at the same price, regardless of whether Tower engaged in its allegedly manipulative Supporting Strategy. Recall that Plaintiffs' theory is premised upon the "true" price of KOSPI 200 futures having moved higher or lower than the prices of the resting limit orders in the order book. Plaintiffs' contend that the price would have moved more quickly toward the supposed true price if Tower's alleged manipulation had not "slowed down" the "price movement towards equilibrium." (Bodek Dep. Tr. at 96:21–25.) But by definition, the best offer price cannot move higher until the resting sell limit orders at that price are removed from the order book. Thus, even in the counterfactual world in which Tower did not employ its Supporting Strategy, the best offer would increase only once the non-lured sell orders at the best offer price are filled, by executing trades. The counterfactual outcome for these orders is identical to the outcome that followed Tower's alleged manipulation: the non-lured orders execute trades at their limit price.⁹ A trader who sells a KOSPI 200 futures contract to Tower at, say, 255.25—as compared to selling the *same contract at the same price* to Tower or a different counterparty, as the trader would have done absent Tower's alleged manipulation—has no claim in equity against Tower.

⁹ Plaintiffs have done nothing to show that the resting limit orders in the KOSPI 200 Night Market would somehow have executed trades at a different price but for Tower's alleged manipulation. Upon reaching the first position in the price/time priority queue, typical limit order processing will cause a resting sell limit order to execute a trade at the order's limit price against any incoming marketable buy order. *See* JOEL HASBROUCK, N.Y. UNIV., SECURITIES TRADING: PRINCIPLES AND PROCEDURES 22 (Dec. 14, 2021), <https://pages.stern.nyu.edu/~jhasbrou/STPP/drafts/STPPms12c.pdf> ("Suppose that it is very early in the day and the MSFT book has one resting order: 'Sell 200 MSFT limit 25.' . . . The price is determined by the resting order. An arriving order, 'Buy 200 MSFT limit 500,' would still result in a trade at 25." (emphasis in original)). The same principle applies with a resting buy limit order and an incoming marketable sell order.

The parties provide no reason to think that CME Globex operates differently from a typical limit order market. In fact, Defendants provide some evidence suggesting that CME Globex follows the ordinary course. Professor Bessembinder's rebuttal report includes an example of a trade that occurred on January 5, 2012 in which the best bid was 244.55 and a marketable sell order was placed with a particularly aggressive limit price of 244.30. The trade was executed at the limit price of the resting buy order: 244.55. (Bessembinder Sur-Rebuttal Report at 12 tbl.1, ECF No. 284-1.)

There is no sense in which an injustice was done as between Tower and this type of non-lured trader; neither equity nor good conscience requires restitution in such a circumstance. Yet, Plaintiffs have done nothing to show that they can prove luring without the use of individualized evidence. Indeed, Plaintiffs' expert conceded that non-lured orders would need to be filtered out for purposes of demonstrating liability, but he provided no way to do so. Bodek testified that his model's ability to detect "executions that were artificially impacted" is "a kind of proof of concept, you know, limited in terms of its accuracy." (Bodek Dep. Tr. at 14:21–24.) He added that the "most important[]" improvement to his model's capacity to determine harm would be adding the ability "to differentiate between transactions that were on the losing end of the sweep that could be argued would have executed and would have happened irrespective of Tower's behavior versus orders that appear to have been lured in and would have been, call it, enticed into the market prior to the sweep." (*Id.* at 15:9–16.) But, as stated *supra*, Bodek offers no way to assess whether an order was lured into the market. Bodek's hopeful statement that he "believe[s] it is possible" to use a model to determine luring is insufficient—especially given that he was unable to identify a single example of a generalized methodology being used to determine which traders have been lured into a market. (*Id.* at 147:24–148:25.)

A second individual issue could enter into the analysis of equity and good conscience. Some putative class members may themselves be sophisticated traders or even other high-frequency trading firms. As Bodek testified, many larger firms have the capacity to tell if they are being "picked off" by another entity that has faster-operating algorithms. (*See id.* at 238:3–239:3.) Yet, a firm may accept the risk of having its orders picked off because the firm's market-making strategy requires having resting limit orders on both the buy and sell sides of the order book. If a sophisticated player knowingly and repeatedly accepted the risk that Tower might be

able to react to new market information more quickly—and pick off the player’s “stale” orders before that player could react to the new information—this reduces the equitable considerations in favor of restitution. *Cf. Ashland Inc. v. Morgan Stanley & Co.*, 652 F.3d 333, 339 (2d Cir. 2011) (holding that “[t]here is little in equity and good conscience that weighs in favor of” restitution when a “sophisticated investor[] failed to apprise itself” of the known risks of a certain type of investment).

Plaintiffs do identify one common issue: Tower’s purported intent not to have its Supporting Orders execute trades. Placing orders with the intent to cancel them before they execute a trade meets common definitions of “spoofing.” *See* 7 U.S.C. § 6c(a)(5)(C). Certainly, whether Tower intended to manipulate the market through spoof trades would be pertinent to the equity and good conscience element. Bodek purports to discern from Tower’s computer code evidence of intent to prevent Supporting Orders from being filled, which would be equally applicable to all class members. But this question does not predominate over the fundamentally individual question of luring—much less the individualized issues raised by the other elements of unjust enrichment.

Plaintiffs have the burden “to establish by a preponderance that common questions would predominate over individual ones.” *Myers v. Hertz Corp.*, 624 F.3d 537, 548 (2d Cir. 2010). They have fallen far short of carrying this burden. Plaintiffs’ motion for class certification must therefore be denied.

III. Damages

Plaintiffs’ predominance problems are not limited to liability. The disparities between Plaintiffs’ theory of liability and their expert’s damages model further militate against certification of the proposed class. The U.S. Supreme Court held in *Comcast* “that a model for

determining classwide damages relied upon to certify a class under Rule 23(b)(3) must actually measure damages that result from the class's asserted theory of injury.” *Roach v. T.L. Cannon Corp.*, 778 F.3d 401, 407 (2d Cir. 2015). A class may be certified in spite of the need to make individualized damages determinations. But the presence of individualized damages questions is one “factor that [a court must] consider in deciding whether issues susceptible to generalized proof ‘outweigh’ individual issues.” *Id.* at 405 (quoting *McLaughlin v. Am. Tobacco Co.*, 522 F.3d 215, 231 (2d Cir. 2008)).

Several inconsistencies between Bodek's analysis and Plaintiffs' theory of liability are outlined in the preceding section. Even if liability could be proven as to one or more class members, though, the damages inquiry would accentuate the degree to which “individual questions will permeate this litigation.” *In re Initial Pub. Offerings Sec. Litig.*, 471 F.3d 24, 45 (2d Cir. 2006). The principal flaw of Bodek's model is the aforementioned lack of a justified benchmark price. Without a valid benchmark against which to compare the execution price of a trade, the model cannot be used to calculate a class member's damages.

Even if a suitable benchmark could be identified, Bodek's damages model is flawed in other ways. First, as discussed above, orders that were not lured into the market by Tower's Supporting Orders must not be considered when assessing damages. Bodek's damages model does not attempt to determine which orders were lured into the market and which orders would have been placed notwithstanding Tower's alleged manipulation. Second, Bodek acknowledged that a damages model ought not to include every instance of the “cancel and sweep” pattern his model considers to create so-named Artificial Price States. He referenced the need to screen out orders that were canceled after being “kept a long time in the order book,” rather than being “flashed and canceled.” (Bodek Dep. Tr. at 28:13–17.) Bodek also stated that some unspecified

proportion of Tower’s orders should be excluded from the model because the orders had “change[d] state” from a Supporting Order to an order at the best bid or offer. (*Id.* at 109:14.) Nevertheless, Bodek’s damages model includes these two types of orders in its calculation of damages. Third, the model has no method of distinguishing between price changes due to a delayed shift toward a “true price” and when information introduced to the market subsequent to a trade independently causes a shift in price.

None of these flaws in Bodek’s damages model can be remedied with a simple, mechanical tweak to his methodology. These issues present deep, conceptual problems, akin to the challenge in *Comcast* of disentangling damages caused by each of four different theories of antitrust liability. *See Comcast*, 569 U.S. at 37–38. Furthermore, Plaintiffs provide scant reason to believe that they could revise Bodek’s damages model in a way that overcomes these conceptual problems. The Court finds that the inadequacies of Plaintiffs’ damages model provide further cause to deny the motion for class certification.

CONCLUSION

For the foregoing reasons, Plaintiffs’ motion for class certification is DENIED. Plaintiffs’ motions to appoint class representatives and class counsel are DENIED as moot. The parties’ joint request for oral argument also is DENIED as moot.

Defendants’ motions to seal portions of Plaintiffs’ memorandum and exhibits in support of the motion for class certification, of Defendants’ memorandum and exhibits in opposition to the motion, and of Plaintiffs’ reply memorandum and exhibit in further support of the motion are GRANTED provisionally, except with respect to the passages that are quoted in this Opinion. The “right of public access to judicial documents is firmly rooted in our nation’s history,” but

courts “must balance competing considerations against” the “presumption of access.” *Lugosch v. Pyramid Co. of Onondaga*, 435 F.3d 110, 119–20 (2d Cir. 2006) (internal quotation marks omitted). The unredacted versions of these submissions will remain sealed for no more than ten weeks—through December 6, 2022—absent further order of this Court. By October 25, 2022, Defendants shall file an unredacted copy of the documents to which they seek to make redactions, red-lining each excerpt they contend should be sealed. Immediately after each excerpt, Defendants shall include an annotation stating the reason or reasons that excerpt should be sealed.

The Clerk of Court is respectfully directed to terminate the pending motions at ECF Nos. 258, 264, 267, and 277.

By October 25, 2022, the parties must jointly submit a letter proposing the next steps in this litigation.

SO ORDERED.

Dated: New York, New York
September 27, 2022

/s/ Kimba M. Wood
KIMBA M. WOOD
United States District Judge